

UNITED STATES PATENT OFFICE.

LEONARD SCHADE VAN WESTRUM, OF BERLIN, GERMANY, ASSIGNOR TO WESTRUMITE COMPANY OF AMERICA, OF CHICAGO, ILLINOIS, A CORPORATION OF MAINE.

PROCESS OF MANUFACTURING WATERY SOLUTIONS OF OILS, FATS, TAR, ASPHALT, &c.

992,313.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, LEONARD SCHADE VAN WESTRUM, a subject of the Queen of the Netherlands, residing at Berlin, Germany, have invented new and useful Improvements in Processes of Manufacturing Watery Solutions of Oils, Fats, Tar, Asphalt, &c., of which the following is a specification.

All the processes now known for the manufacture of emulsions consisting of water and oily or fatty substances for use as a medium for binding and holding together road-making materials, such as broken stones, sand, dust, earthy materials and the like, and for the further purpose of preventing the formation and dissemination of dust on road-beds and other like surfaces, result in an emulsion which is objectionable, for the reason that water caused by rain or melted snow, etc., will in time either entirely wash away the body ingredients or emulsify the same to such an extent that the emulsion and the dust will join together to create mud, and thus render the road slippery in warm weather. During cold weather the body ingredients absorb so much water that they freeze, and the street is thereby caused to break or crack. Attempts have been made to overcome these objections by sprinkling a road, after it has been treated with such emulsions, with a solution of salt. Such attempts, however, have not proved satisfactory, by reason of the great cost of the same and the expenditure of the considerable additional time required for such subsequent treatment.

The object of my present invention is to provide an improved process for the manufacture of watery solutions or emulsions of mineral or resin oils, so as to overcome the aforesaid objections against the use of such solutions or emulsions.

As the main ingredient or body of my improved emulsion I use all sorts of asphaltic, paraffinic and tarry substances, coal tar and asphalt being the most suitable for emulsions adapted for use in making and maintaining roads.

If the body materials could be placed in suspension in a liquid vehicle in a minutely divided state, the particles would soon adhere to each other sufficiently to cause settling. It is therefore necessary to add some

substance, such as soap, which is capable of forming a thin film over each particle and thus prevent adhesion between the different particles. This soap, as such, is however of no value after the emulsion has been applied and the liquid vehicle evaporated, but, on the other hand, it is this soap which gives rise to the objections to which reference has been made.

In accordance with my invention I make use of a soap which is nonpermanent in character and breaks up very soon after it has been exposed to the air. When an emulsion containing such a soap is applied to a roadway, the soap breaks up, increasing the tenacity of the remaining substances and rendering them immune to subsequent rain or snow.

In carrying out my invention I make use of any saponifiable substance and a volatile alkali for the production of the soap. Resin oil or olein or any animal or vegetable fatty acid will serve for the saponifiable element and ammonia as the oxidizing element. The soap may be made independently or as a part of the process of producing the emulsion.

An emulsion of crude oil may be made in accordance with my invention as follows: 45% to 55% of crude oil at a temperature in the neighborhood of the boiling point of water is thoroughly mixed with 25% to 50% of water, 6% resin oil and 3% olein. The mixture is then thoroughly agitated, preferably by means of a strong current of air and this agitation is continued while about 2% of ammonia is added and until saponification and complete emulsification results.

The best mixture when using asphalt is made by melting 50 kilo of asphalt and by adding to the molten mass 450 kilo of crude oil. The process is then completed as follows: 65% of the aforesaid crude oil and asphalt mixture is heated to a temperature of between 80 degrees and 90 degrees Celsius; whereupon a current of air is forced through for a period of from 20 minutes to one hour; then 10 to 25 per cent. of water is added, whereupon air is again forced through the mixture for a period of half an hour; 8 or 10 per cent. of olein is then added to the mixture and air is again blown through the same for about ten minutes, when 2% of ammonia is added; air is then

blown through until complete emulsification results.

When my improved emulsion is applied to a road bed either to bind together the dust on the surface or the broken stone of which the bed is made, the volatile alkali of the soap is soon dissipated by the action of the light and air so that soap, as such, is no longer present. Consequently the remaining tarry, asphaltic, and oily particles are capable of binding the materials of the road to the same degree as if the soapy films had never been present and furthermore, because of the insolubility of the remaining elements, there is no danger that they will be washed away through rains as is the case where soaps are employed which are permanent in character and therefore maintain the oily, tarry or asphaltic ingredients in a state which permits them to form an emulsion whenever water is present.

I claim—

1. The process of manufacturing watery solutions of substances which are not naturally soluble or emulsifiable in water which consists in mixing said substances while heated with a saponifiable oil, adding water and a volatile alkali and agitating the mixture.

2. The process of manufacturing watery solutions of substances which are not naturally soluble or emulsifiable in water which consists in adding to said substances a saponifiable oil, heating said substances and oil, agitating the heated mass, adding water to the mass and again agitating, adding a volatile alkali and agitating the mixture until complete emulsification results.

3. The process of manufacturing watery solutions of substances which are not soluble or emulsifiable in water which consists in adding to said substances a saponifiable oil, heating said substances and oil, agitating

the heated mass, adding hot water to the mass and again agitating, adding a volatile alkali and agitating the mixture until complete emulsification results, and finally adding more water.

4. The process of manufacturing watery solutions of substances which are not naturally soluble or emulsifiable in water which consists in first heating a mixture of such a substance and an emulsifiable oil, agitating the heated mixture, adding water and again agitating, adding ammonia, and finally agitating the mixture until complete emulsification results.

5. The process of manufacturing watery solutions of substances not naturally soluble or emulsifiable in water which consists in first heating a mixture of such a substance and an emulsifiable oil, passing a current of air therethrough for a period of twenty minutes to one hour, then adding water and again passing air therethrough for half an hour, then adding ammonia and finally passing a current of air through the mixture until complete emulsification results.

6. The process of manufacturing watery solutions of substances not naturally soluble or emulsifiable in water which consists in mixing from 45% to 55% of crude oil at a temperature in the neighborhood of the boiling point of water with 25% to 50% of water, 6% resin oil, and 3% olein, agitating the mixture and then adding 2% of ammonia and again agitating until complete emulsification results.

In testimony whereof, I have hereunto set my hand in the presence of two witnesses, this 28th day of August A. D. 1905.

LEONARD SCHADE VAN WESTRUM.

Witnesses:

R. B. HOLLEY,

FRED. G. FISCHER.